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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/914,868	08/19/1997	ERIK J. BJORNARD	07041/106001	9256

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EXAMINER

CHANG, AUDREY Y

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 12/20/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

08/914,868

Applicant(s)

BJORNARD ET AL.

Examiner

Audrey Y. Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-15, 17-22, 31-43 and 47-53 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-15, 17-22, 31-43 and 47-53 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other:

DETAILED ACTION

Remark

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.
2. The rejections to claims 9, 10, 19-22, 31-37, 39, 43, 47 and 50-53 under a defective reissue declaration under 35 U.S.C. 251 as set forth in the previous Office Action dated December 21, 2000 are withdrawn in response to applicant's request for reconsideration.
3. Claims 1-5, 7-15, 17-22, 31-43 and 47-53 remain pending in this application.
4. The rejections to claims 33-34 and 40-42 under 35 USC 112, first paragraph, with regard to added new matters set forth in the previous Office Action still hold.
5. Due to the long prosecution history and the number of amendments present in this application, the examiner respectfully request the applicant to provide a copy contains all the pending claims in the application, in the next communication, to ease the examination process.

Response to Amendment

6. The amendment filed on October 6, 2000 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: the newly added claim 50 recites "said at least one another layer" that is not the high refractive material layers and not the low refractive index layers. The specification fails to give support for an anti-reflection coating to have layers other than being "high refractive index layers" or "low refractive index layers".

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. **Claims 50-52 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.** The rejection based on the newly added matters are set forth in the paragraph above. Claims 51 and 52 inherit the rejection from their based claim.

9. **Claims 33-34 and 40-42 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.** The reasons for rejection based on newly added matters are set forth in the previous Office Action dated May 25, 2000.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. **Claims 1-5, 7-15, 17-22, 31-43, and 47-53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

The term "substantially" recited in the various claims is indefinite since it is not clear to what degree this term should be interpreted.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 1-5, 7-8, 11-15, 17-18, 33-35, 38, 39-40, 43, 48, and 49-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okaniwa (PN. 5,667,880) in view of the patent issued to Dickey et al (PN. 5,372,874).

Okaniwa teaches an electroconductive *antireflection film* that is comprised of a multilayer structure including a first and third layers, with the first layer being the outermost layer, that each of them is composed of a *low refractive index material* such as *silicon dioxide* (index refraction equals 1.46), a second layer that is composed of high refractive index layer having a refractive index ranged between 1.8 to 2.9, and a fourth layer (23) that is comprised of electroconductive material such as *tin-doped indium oxide* (which known in the art as ITO with index refraction equals 1.97). Okaniwa teaches that the second layer may comprise any art recognized high refractive materials having the refractive index in the ranged taught and the electroconductivity of the film may be increased if the second layer is composed of tin-doped indium oxide, (please see Figure 1 columns 4 and 5). Okaniwa also teaches that the multilayer structure is formed *by reactively sputtering* the layer materials to a substrate layer (11), (please see columns 8-9). Okaniwa teaches that the substrate may include material such as glass with an index refraction of 1.52. It is noted that the index of refraction of the layer materials for first and third layer is therefore lower than the refractive index of the substrate and the index of refraction for layer material of second and fourth layers is greater than the substrate material. The glass substrate is also obviously temperature sensitive.

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This reference has met all the limitations of the claims with the exception that it fails to disclose explicitly that the substrate material may also assume plastic material. However to form multilayer antireflection coating by reactively sputtering dielectric oxides materials **either to a plastic substrate or to a glass substrate** are very well known in the art and they are considered to be **art-recognized equivalents** as demonstrated by the teachings of Dickey et al. Dickey et al teaches a multilayer antireflection coating having the most well known Rock-type structure is coated either on a glass substrate or a plastic substrate (14, Figure 1, column 6, lines 20-23). Therefore, because using a glass substrate or plastic substrate were art-recognized equivalents at the time the invention was made, one of the ordinary skill in the art would have found it obvious to substitute a plastic substrate for a glass substrate.

With regard to feature concerning the layer materials for the high refractive index layer, Okaniwa teaches that the layer materials may have various dielectric oxides having refractive index ranging from 1.8 to 2.9. Okaniwa teaches several known oxides with these refractive indices however it does not teach the cited materials such as zinc oxide or tin oxide. Dickey et al in the same field of endeavor teaches that layer materials such as tin oxide or zinc oxide having refractive index of 1.9-2.0 and good DC reactive sputtering rate are also suitable materials for forming antireflection coating, (please see column 2). It would therefore have been obvious to one having ordinary skilled in the art to use either zinc oxide or tin oxide as the high refractive index layer material since it has been held to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

With regard to the feature concerning the layer thickness being quarter of wavelength, Okaniwa does not teach explicitly about such. However it is a well-known practice in the art to adjust the optical thickness of each layer for the purpose of obtaining and designing a desired transmittance/reflectance characteristic for the film. Furthermore, Dickey et al in the same field of endeavor teaches an anti-

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reflective coating with the multilayer structure that assumes the well-known Rock-type structure that reads on the structural limitations of the claims, (please see Figure 6 and column 6). It would therefore have been obvious to one having ordinary skill in the art to apply the teachings of Dickey et al to modify the structure of the anti-reflective film of Okaniwa for the benefit of obtaining desired reflectance/transmittance characteristics.

14. Claims 47 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Dickey et al (PN. 5,372,874).

Dickey et al teaches a *antireflection coating* with a *Rock-type structure* that is having a first, the outermost layer, and third layer (12 and 18 Figure 1) each comprises a *low refractive index material* such as *silicon dioxide* and a second and fourth layer made of *high refractive index materials*. The coating is coated on a *plastic substrate* (14), (please see Figure 1 and column 6). Dickey et al in one example teaches that the high refractive material is of niobium oxide. However Dickey et al also teaches that layers materials such as zinc oxide and tin oxide having refractive index of 1.9 to 2.0 are good layer materials having good DC-reactively sputtering rate for antireflective coating. It would then have been obvious to one skilled in the art to make the antireflection coating having Rock type structure with zinc oxide or tin oxide as the high refractive index layer materials for it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended used as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Allowable Subject Matter

15. Claims 9, 10 and 36-37 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

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16. Claims 19-22, 31-32 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

17. The following is a statement of reasons for the indication of allowable subject matter: of the prior art references considered none has disclosed an antireflection coating for a substrate that is comprised of a first layer of silicon dioxide, a second layer of tin oxide, a third layer of silicon dioxide and a fourth layer of tin oxide arranged in consecutive numerical order with the first layer being the farthest from the substrate where each layer has the specific physical thickness as claimed.

Response to Arguments

18. Applicant's arguments filed on October 6, 2000 have been fully considered but they are not persuasive. The response to arguments are set forth in the previous Office Action dated December 21, 2000.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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Audrey Y. Chang
Primary Examiner
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A. Chang, Ph.D.
December 18, 2001

A handwritten signature in black ink, appearing to read 'Audrey Y. Chang', with a large, sweeping initial 'A' and a stylized 'C'.